REMARKS

Applicant concurrently files herewith an Excess Claim Fee Payment Letter for nine (9) excess claims and one (1) excess independent claim.

Claims 1-40 are all the claims presently pending in the application. Claims 1, 3-18 and 23-31 have been amended to more particularly define the invention. Claims 32-40 have been added to provide varied protection of the claimed invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Applicant gratefully acknowledges the Examiner's indication that claims 2, 3, 6-14, and 16-34 are allowed.

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Okamoto et al. (JP Patent Pub. No. 09-049937) in view of Nakajima et al. (U.S. Patent No. 6,404,946). Claims 4, 5 and 15 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g., as defined by claim 1) is directed to an arrayed waveguide grating having a slab-waveguide. The slab-waveguide includes a plurality of input ports for inputting signals of different wavelengths, an output port disposed on the focus position of the 0-th order diffraction beam inputted from the input port, and a monitor signal port disposed on the focus position of higher order diffraction beams other than the 0-th order diffraction beam.

Conventional arrayed waveguide gratings provide N input waveguides for wavelength monitoring, N input waveguides for signal inputting and also output waveguides for

wavelength monitoring. An input side slab-waveguide is provided for interconnecting the input waveguides and a waveguide array, and an output side slab-waveguide is provided for interconnecting the waveguide array and the output waveguides (Application at page 2, lines 9-29). In this arrangement certain input waveguides and certain output waveguides are used for the signals, while other input waveguides and output waveguides are used for wavelength monitoring. This makes monitoring with the actual signals impossible using the conventional arrayed waveguide gratings (Application at page 3, lines 1-11).

The claimed invention of exemplary claim 1, on the other hand, provides an arrayed waveguide grating having a slab-waveguide that includes a plurality of input ports for inputting signals of different wavelengths, an output port disposed on the focus position of the 0-th order diffraction beams inputted from the input ports, and a monitor signal port disposed on the focus position of higher order diffraction beams other than the 0-th order (Application at page 4, lines 13-23). This permits the arrayed waveguide grating of the present invention to use actual signals to be multiplexed for monitoring these signals, while suppressing the system size as much as possible (Application at page 3, lines 13-18).

II. THE 35 USC §112, SECOND PARAGRAPH REJECTION

Claims 4, 5, and 15 stand rejected under 35 U.S.C. §112, second paragraph. The claims have been amended, above, to overcome this rejection. Specifically, claims 4 and 5 have been amended to replace the term "peculiar" with the term "individual". Claim 15 has been amended to replace the phrase "a predetermined position of the substrate" with the phrase "an end face of the substrate".

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

III. THE PRIOR ART REFERENCES

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Okamoto in view of Nakajima. The Examiner alleges that it would have been obvious to those skilled in the art to combine the references to obtain the claimed invention as recited in claim 1.

Applicant respectfully disagrees with the Examiner.

Okamoto discloses an optical multiplexer/demultiplexer used for a wavelength monitoring circuit for monitoring each wavelength of a wavelength multiplexed signal light beam having an unequal channel interval by arranging an input waveguide for monitoring wavelength together with an input waveguide for signal and arranging output waveguides for monitoring wavelength on both sides of the output waveguide. An input waveguide for monitoring wavelength 21 is set at the same unequal interval as a signal input waveguide 11 and arranged on the position where the input waveguide 11 is laterally shifted as it is.

Since the input waveguide for monitoring wavelength 21 is arranged by being deviated from the center line of a sectorial slab waveguide 14 on the input side, light beams of two diffraction orders are generated. Output waveguides 22, 23 are arranged on somewhat inner side of the position when two diffraction light beams are generated. By successively changing the port of the input waveguide for monitoring wavelength 21 and finding the level ratio of output ratio of output light beams of the output waveguides 22, 23, the characteristic of wavelength discrimination for every channel complied with the input port is obtained (Okamoto at Abstract).

Okamoto, however, does not teach or suggest "*an output port disposed on the focus position of the 0-th order diffraction beam inputted from the input port*" as recited in claim 1.

As noted above, unlike conventional arrayed waveguide gratings, the claimed invention of exemplary claim 1 provides an arrayed waveguide grating having a slab-waveguide that includes a plurality of input ports for inputting signals of different wavelengths, an output port disposed on the focus position of the 0-th order diffraction beams inputted from the input ports, and a monitor signal port disposed on the focus position of higher order diffraction beams other than the 0-th order (Application at page 4, lines 13-23). This permits the arrayed waveguide grating of the present invention to use actual signals to be multiplexed for monitoring these signals, while suppressing the system size as much as possible (Application at page 3, lines 13-18).

Clearly the novel features of the claimed invention are not taught or suggested by Okamoto. Indeed, the Examiner concedes that Okamoto does not teach or suggest all of the

novel features of the claimed invention.

The Examiner alleges that Okamoto discloses an array waveguide diffraction grating which comprises an input waveguide 11 coupled to a slab waveguide 14 comprising a plurality of inputs. The Examiner alleges that Okamoto discloses that each wavelength of the wavelength multiplexed system is monitored and that the waveguide for monitoring input 12 is also coupled to the slab waveguide. The Examiner relies on Figure 1 and the Abstract of Okamoto for supporting these allegations.

Nowhere, however, in Figure 1 or the Abstract (nor anywhere else for that matter) does Okamoto teach or suggest an arrayed waveguide grating including an output port disposed on the focus position of the 0-th order diffraction beam inputted from the input port, and a monitor signal port disposed on the focus position of higher order diffraction beam other than the 0-th order diffraction beam. In fact, the Examiner concedes that Okamoto does not disclose an output port disposed to focus the 0-th order diffraction beam.

The Examiner alleges that Nakajima would have been combined with Okamoto to form the claimed invention of claim 1. Applicant submits, however, that even if these reference were combined, the combination would not teach or suggest each and every element of the claimed invention.

Nakajima discloses an arrayed waveguide grating type optical multiplexer/demultiplexer including an arrayed waveguide grating having a plurality of channel waveguides.

Nakajima, however, does not teach or suggest "*an output port disposed on the focus position of the 0-th order diffraction beam inputted from the input port*" as recited in claim 1.

Indeed, the Examiner merely attempts to rely on Nakajima as suggesting that typically the type of slab waveguide disclosed in Okamoto is configured to focus the signals on the opposite face of the curved slab. The Examiner relies on column 2, lines 35 through 48 and Figure 8 to support this allegation.

Nowhere, however, in this passage nor Figure 8 (nor anywhere else for that matter) does Nakajima teach or suggest an arrayed waveguide grating including an output port disposed on the focus position of the 0-th order diffraction beam inputted from the input port,

and a monitor signal port disposed on the focus position of higher order diffraction beam other than the 0-th order diffraction beam.

In fact, neither Nakajima nor Okamoto discloses or suggests an output port disposed on the focus position of the 0-th order diffraction beam inputted from the input port. As shown in Figure 1 of the Application, the 0-th order focus point is disposed at a specific position along the slab waveguide. The focus point is located at the center of the edge of the slab waveguide. As shown in Okamoto and Nakajima, the outputs are not focused at the center of the edge of the slab waveguide. The outputs are located in several positions, which deviate from the focus point of the 0-th diffraction beams.

Therefore, Applicant submits that these references, even if combined, would not teach or suggest each and every element of the claimed invention as recited in claim 1. Therefore, the Examiner is respectfully requested to withdraw this rejection.

IV. NEW CLAIMS

New claims 32-40 are added to provide more varied protection for the present invention and to claim additional features of the invention. These claims are independently patentable because of the novel features recited therein.

Applicant respectfully submits that new claims 32-40 are patentable over any combination of the applied references at least for analogous reasons that are analogous to the reasons set forth above with respect to claim 1.

V. FORMAL MATTERS AND CONCLUSION

In response to Examiner's objections, the specification and drawings have been amended in a manner believed fully responsive to all points raised by the Examiner. Specifically, the Examiner objects to the disclosure based upon use of the term "peculiar" when referring to wavelengths on page 6, in the second full paragraph, and page 8, in the first full paragraph. Applicant has amended the specification to correct these informalities. The Examiner objects to Figures 25 and 26 as failing to include the term "prior art" as a legend. Applicant has amended Figures 25 and 26 to include the term "prior art".

In view of the foregoing, Applicant submits that claims 1-40, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview. The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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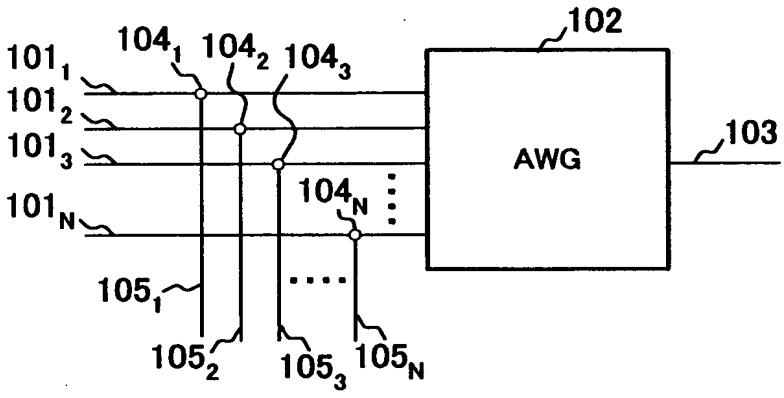
PRIOR ART **FIG.25**



PRIOR ART **FIG.26**